Annual Guernsey Population Projection Bulletin

Issue date June 2018

The Population Projection Bulletin provides 50 year forecasts for the total population in Guernsey and related data.

States of Guernsey
Strategy and Policy

States of Guernsey
Data and Analysis

1.1 Introduction

The Population Projection Bulletin provides an extrapolation of the total population of Guernsey and other related data series, such as the population in specified age groups and dependency ratios. The data are based on the current profile of the population to which a series of assumptions are applied. Central projections are made using assumptions that best fit historical averages: an average fertility rate (the number of children each woman will give birth to in her life time) of 1.6 and annual net immigration of 100 people per annum. The fan charts presented also demonstrate the range of outcomes produced when these assumptions are varied. These assumptions are detailed further in **Appendix 1**.

These projections are produced using the Government Economic Modelling system ('GEM') and draw on data collected via the Rolling Electronic Census. GEM enables the States of Guernsey to extrapolate the population and other data series based on the most up to date information and to test their sensitivity to factors such as fertility rates and migration. The projections are used to inform robust, long-term policy development and government decision making.

2.1 Headlines

- Like the majority of developed economies, Guernsey has a population that is aging.

- Projections indicate limited change in the total size of the population. The population is forecast to increase to a maximum of approximately 64,000 people by 2034, 2.6% larger than the current population. Beyond this point the population is projected to fall, declining to 59,000 by 2065.

- The population between compulsory school age and state pension age is projected to decline throughout the period. This is reflected in a fall in the workforce at an average rate of 0.4% per annum. It is estimated that an average level of annual net immigration of between 200 and 300 people would be required to maintain the size of the workforce at its current level.

- A significant increase in the number of people above state pension age is expected to continue through the majority of the period. The number of people aged 85 or over is likely to double by 2034 and treble by 2047.

- Combined, these changes contribute to a projected increase in the dependency ratio from 0.55 in 2017 to 0.67 in 2049.

### Figure 2.1.1: Total projected population for Guernsey
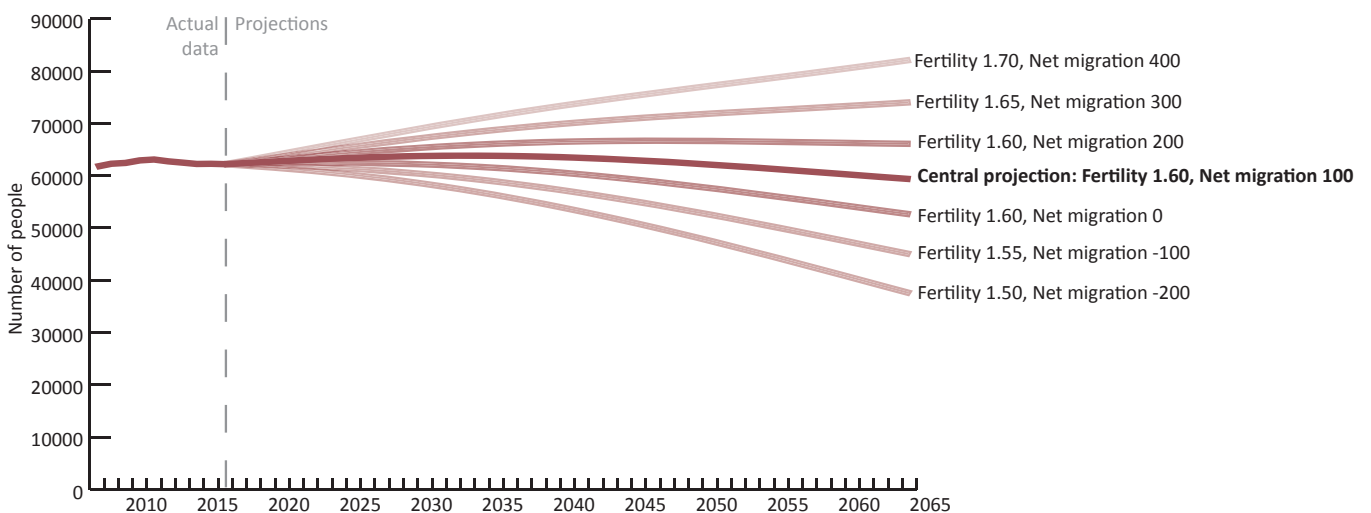
Table 3.1.1: Projection of the population
(assuming annual net migration of 100 people and fertility rate of 1.6)

	Total population	Cumulative % change from current
Current (March 2017)	62,193	
2020	62,646	0.7
2025	63,307	1.8
2030	63,719	2.5
2035	63,809	2.6
2040	63,575	2.2
2045	63,047	1.4
2050	62,300	0.2
2055	61,379	-1.3
2060	60,363	-2.9
2065	59,353	-4.6

Figure 3.1.1: Contribution to population change
(assuming annual net migration of 100 people and fertility rate of 1.6)
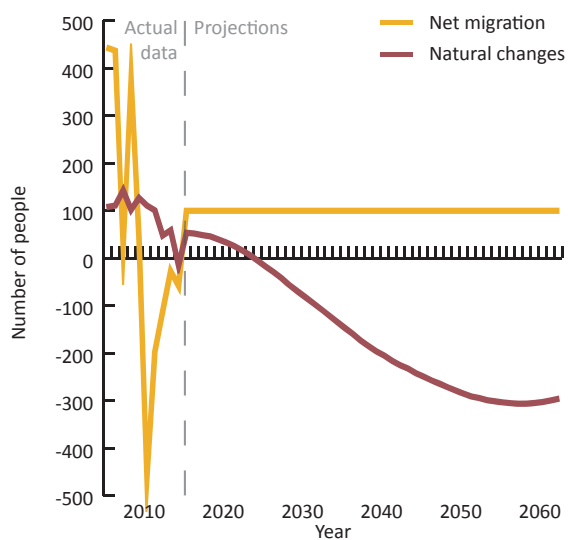
Guernsey's total population has been extrapolated using central assumptions of an average level of annual net immigration of 100 people and a total fertility rate of 1.6 (see **Appendix 1** for details). Under these assumptions Guernsey's population is projected to show small annual increases until 2034 (**figure 2.1.1** and **table 3.1.1**) reaching a level approximately 2.4% greater than it was in March 2017. Beyond 2034, the population may begin to decline, with central estimates falling to 59,400 by 2065, 4.6% smaller than that reported in March 2017.

The coloured fan in **figure 2.1.1** highlights the uncertainty in these projections. The lines above and below the central scenario illustrate the impact of varying the assumptions of the average fertility rate and net migration. This is important because net migration in particular is very volatile and can vary substantially from year to year (see **figure 3.1.1**). For example, increase in the assumption of net migration to 200 people increases the forecast maximum population to 66,700 and defers the peak to 2047 (see **figure 2.1.1**). In contrast, reducing the level of net migration to zero, reduces the population peak to 62,400 and brings it forward to 2024 and reduces the projected population in 2065 to 52,600.

Figure 3.1.1 also shows the contributions of net migration and natural population changes (the difference between the number of births and the number of deaths). It demonstrates an upward contribution from natural changes until 2027. Beyond 2027 the number of deaths is projected to exceed the number of births and the contribution of natural changes to the population is downwards. By 2034 the downward contribution is anticipated to exceed the upward contribution from net migration resulting in a fall in the overall population.

Figure 3.2.1 shows the changing distribution of the population over time by age and gender. The modal (or largest) age group is shifting upwards from 50-54 in 2017 to 65-69 by 2037.

Figures 3.2.2 to **3.2.5** show the population in four key age groups:

- Children of or below compulsory school age, that is those aged 0-15 (**Figure 3.2.2**)
- Adults aged between compulsory school age and state pension age* (**Figure 3.2.3**)
- Adults above state pension age* but below 85 (**Figure 3.2.4**)
- Adults aged 85 or more (**Figure 3.2.5**)

These projections are also summarised in **Table 3.2.1**

Children of or below compulsory school age
Projections show that the number of children in the community will increase slightly over the next three to four years and is then expected to decline over time at an average rate of approximately 0.5% a year (**figure 3.2.2**). The decline is a result of a numbers of factors, including a central assumption of a fertility rate of 1.6 and a continuing decline in the number of women of child bearing age. The international standard replacement rate, the fertility rate required to sustain a stable population in the long term, is 2.1*.

At a further level of detail, the number of children of primary school age is anticipated to decline throughout the period. The number of children of secondary school age is expected to reach a peak in approximately 2025, before declining.

Projections within this age group are particularly sensitive to fertility rate assumptions and, to a lesser extent, net migration.

Adults aged between compulsory school age and state pension age**
Typically termed 'working age adults', this group makes up the core of both the productive workforce and the tax base. **Figure 3.2.3** shows a sustained decline in the working age population. The rate of decline, which averages 0.3% per annum across the period, is mitigated by the increase the state pension age for 65 to 70 between 2020 and 2049.

* www.who.org
**Data projected using state pension age are adjusted to account for the agreed policy to increase state pension age from 65 to 70 between 2020 and 2049.

Figure 3.2.1: Population pyramid
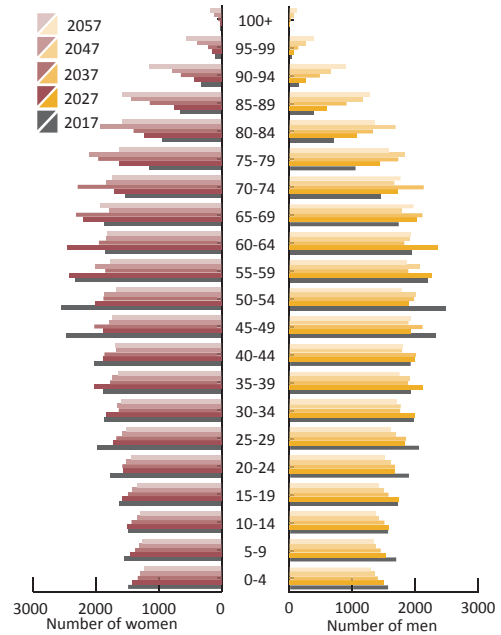**(assuming annual net migration of 100 people and fertility rate of 1.6)**

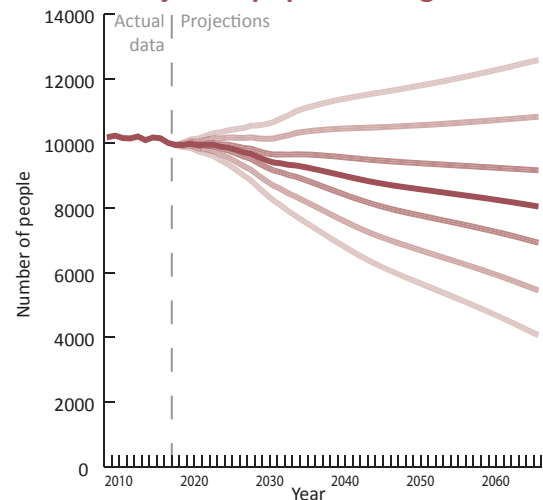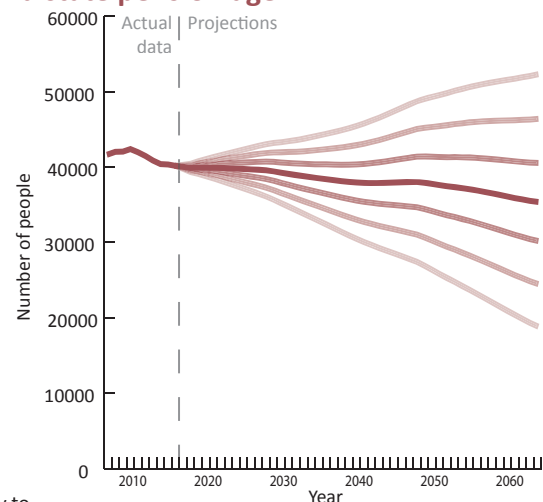

Figure 3.2.2: Projected population aged 0-15

Figure 3.2.3: Projected population between age 16 and state pension age**

Figure 3.2.4: Projected population between state pension age and age 84**
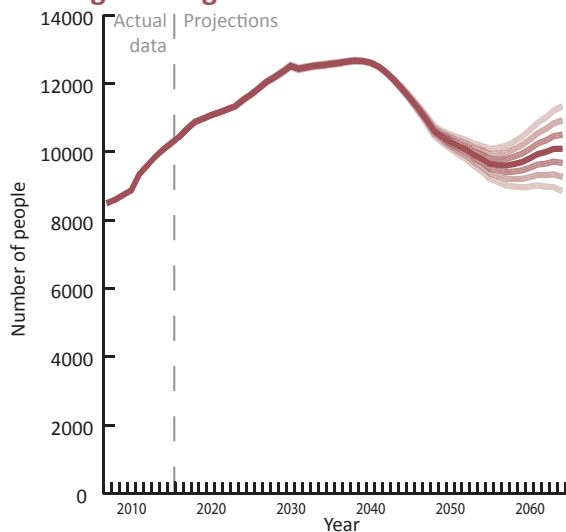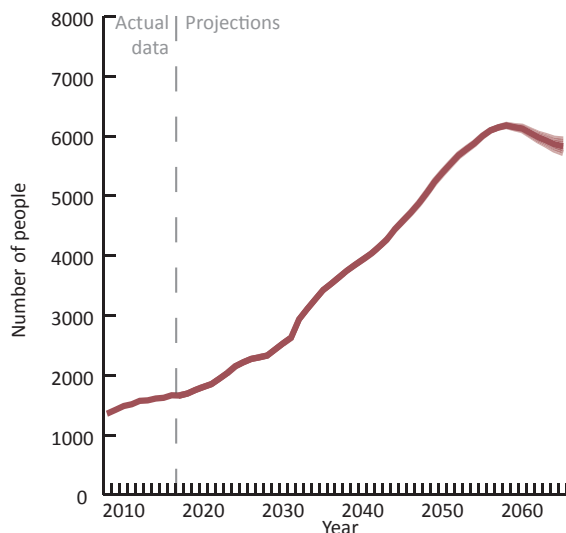

Figure 3.2.5: Projected population aged 85 or more

These projections are very sensitive to net migration and (in the longer term) fertility rates.

Adults aged between state pension age and 84**
This group represents those who are in receipt of an old age pension and are typically less active in the economy. This group will also typically be drawing a pension and have increased medical needs, although most will not reach the peak of their medical and care needs until the progress beyond 84.

Projections show a rapid and sustained increase in this age group averaging 1.3% a year until 2031 (**figure 3.2.4**). At this point the first of the "baby-boom" generation, born in 1946, progress beyond this age group resulting in a slower rate of increase and eventual decline in this age group. The projected size of this age group are largely insensitive to assumptions of net migration and fertility over the period.

Adults age 85 and over
This group represents those in the community who have the greatest need for medical and care services. This demographic is likely to increase rapidly until approximately 2052 (**figure 3.2.5**), with the annual rate of growth averaging 3.6% per annum. Beyond this point the rate of growth is expected to slow as more people reach their assumed life expectancy. This age group is expected to contract beyond 2059. Projections in this age group are wholly insensitive to assumptions on net migration and fertility.

Table 3.2.1: Population projection by age group
(assuming annual net migration of 100 people and fertility rate of 1.6)

	Aged 0-15	16 - State pension age*	State pension age* to age 84	Age 85+	Total population
Current (March 2017)	9,949	40,154	10,429	1,661	**62,193**
2020	9,945	39,929	10,967	1,805	**62,646**
2025	9,798	39,781	11,510	2,218	**63,307**
2030	9,406	39,439	12,339	2,535	**63,719**
2035	9,222	38,631	12,533	3,423	**63,809**
2040	8,958	38,028	12,654	3,935	**63,575**
2045	8,726	37,906	11,837	4,579	**63,047**
2050	8,559	37,913	10,441	5,388	**62,300**
2055	8,398	37,184	9,798	5,999	**61,379**
2060	8,235	36,303	9,698	6,126	**60,363**
2065	8,050	35,382	10,089	5,832	**59,353**

4.1 Workforce

Figure 4.1.1 and **Table 4.1.1** provide forecasts of the size of the workforce in Guernsey. These forecasts are produced under an assumption that workforce participation rates of five year age group bands under 65 remain constant over time. Participation among those aged between 65 and 69 is assumed to increase as the state pension age is raised and it is assumed a small percentage of people continue to participate in the workforce beyond state pension age. The intention of these assumption is to demonstrate what the total size of the workforce may be if workforce conditions continue to be broadly the same as they are currently.

Figure 4.1.1 demonstrates the decline in the workforce though out the period. The projections show an average rate of decline is approximately 0.4% per annum, resulting in a cumulative reduction in the workforce of 2% by 2025 and 8% by 2035.

Workforce projections are highly sensitive to net migration assumptions because migration both into and out of Guernsey is typically employment related. This means that the vast majority of migratory movements occur among the working age population. Average levels of inward migration of between 200 and 300 people per year are required to maintain the size of the workforce at its current level.

While the projections are made assuming constant age specific rates of workforce participation, there is a decline in the overall participation rate over time because rates of participation vary significantly between age groups (**figure 4.1.2**).

*Data projected using state pension age are adjusted to account for the agreed policy to increase state pension age from 65 to 70 between 2020 and 2049.
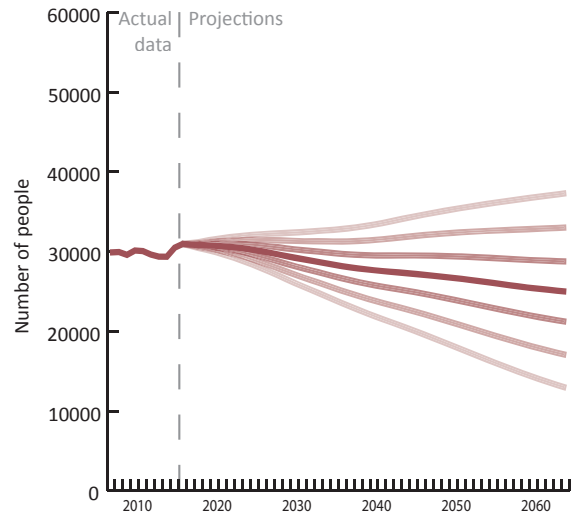
Figure 4.1.1: Projected workforce*

Table 4.1.1: Projection of the workforce*
(assuming annual net migration of 100 people and fertility rate of 1.6)

	Total size of the workforce
Current (March 2017)	30,977
2020	30,810
2025	30,384
2030	29,451
2035	28,551
2040	27,785
2045	27,333
2050	26,828
2055	26,214
2060	25,534
2065	25,015

Figure 4.1.2: Projected aggregate workforce participation rates
(assuming annual net migration of 100 people and fertility rate of 1.6)
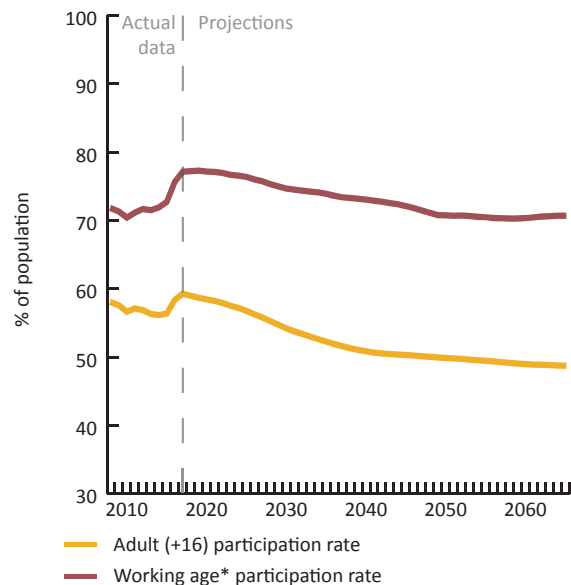
Adult (+16) participation rate
Working age* participation rate

5.1 Dependency ratios

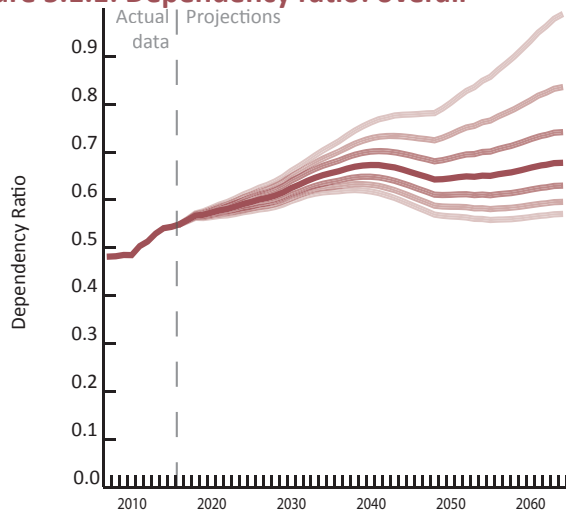## Figure 5.1.1: Dependency ratio: overall

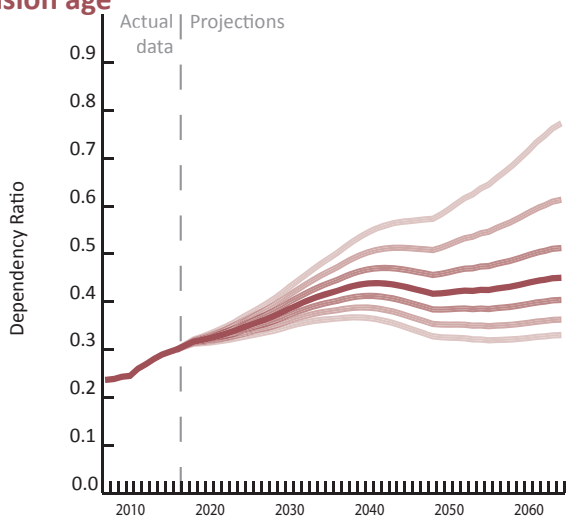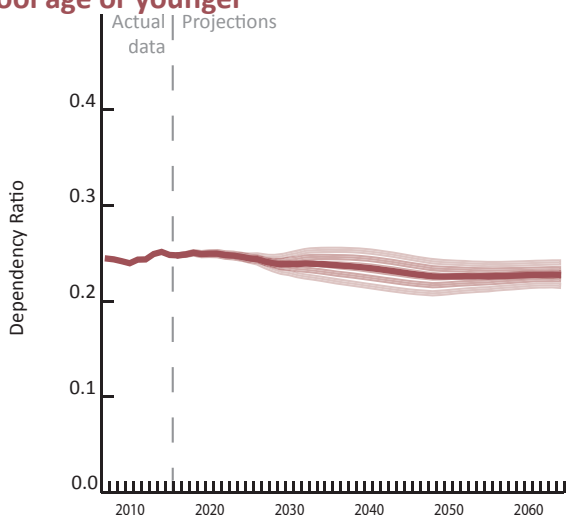## Figure 5.1.2: Dependency ratio: above state pension age*

Figure 5.1.3: Dependency ratio: compulsory school age or younger

Dependency ratios are calculated by dividing the total number of people in the dependant population (those of compulsory school age and below and those above state pension age) by the number of people of working age. They are intended to provide an indication of the number of people who are not economically active and who use the majority of government funded services (such as education, health and social care and public pensions), relative to number of people who are economically active and therefore contributing the most to government revenues. For example, in 2017 the dependency ratio in Guernsey was 0.54, meaning that for every 100 people of working age there were 54 people who were either above or below working age.

Figure 5.1.1 shows dependency ratios for Guernsey increasing from 0.54 in 2017 to a peak of 0.67 in 2042. Beyond 2042, dependency ratios are projected to reduce a little for a short time before rising again. Dependency ratios are highly sensitive to assumptions of net migration, primarily because of the impact this has on projections of the working age population and therefore increasing the net immigration assumption has lowers dependency ratios.

Figures 5.1.2 and **5.1.3** show the division of the dependency ratios between those above state pension age and those of compulsory school age or below. Together these two figures illustrate that the increase in the number of people above state pension age is the primary driving factor behind the projected increase. The dependency ratio for those above state pension age is projected to follow the same pattern of increases as the overall dependency ratio.

By contrast the dependency ratio for those of compulsory school age or younger is projected to stay broadly constant, primarily as a result of the assumption of constant fertility rates in the projections (**figure 5.1.3**). These are largely insensitive to changes in the assumption of net migration because of the co-movement in the projections of those aged under 15 and those of working age.

*Data projected using state pension age are adjusted to account for the agreed policy to increase state pension age from 65 to 70 between 2020 and 2049.

6.1 Births and deaths

Typically people require the most medical and care services at the beginning and end of their lives. The number of births and deaths in the community is therefore important not only for the net contribution to the total population number, but in planning the aggregate level of health and care services required.

Figure 6.1.1 shows the projected number of births in Guernsey each year. The annual number of births is projected to decline over time as a result of a decline in the number of women of child bearing age in the community. This is a cumulative result of the assumed persistence of levels of fertility (the number of children each woman will give birth to in her life-time) below the replacement rate of 2.1. Levels of fertility in most developed economies have been substantially below this level since the mid to late 1970s and central projections assume that the recent average total fertility rate of 1.6 persists through the period. Increasing or decreasing the assumed fertility rate has a substantial impact on the number of births expected.

Projected births are also sensitive to assumptions of net migration that may impact the number of women of child bearing age in the community.

The number of deaths which occur in Guernsey is expected to increase as the population ages (**Figure 6.1.2**) and is closely correlated with the size of the population aged over 85. Like the projections of those aged over 85, projections of the annual number of deaths show very little sensitivity to assumptions of either net migration or fertility.
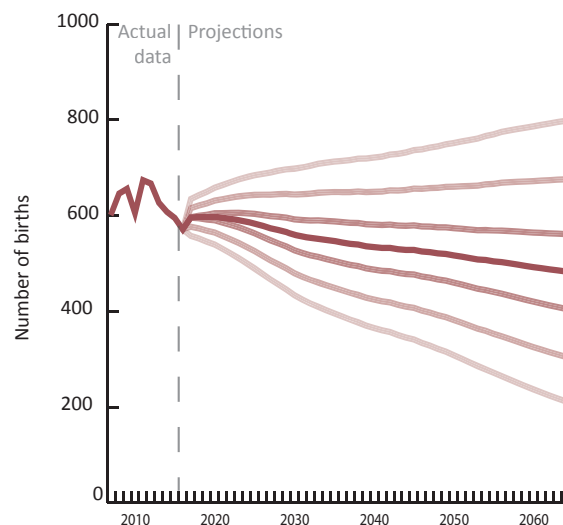
Figure 6.1.1: Projected number of births

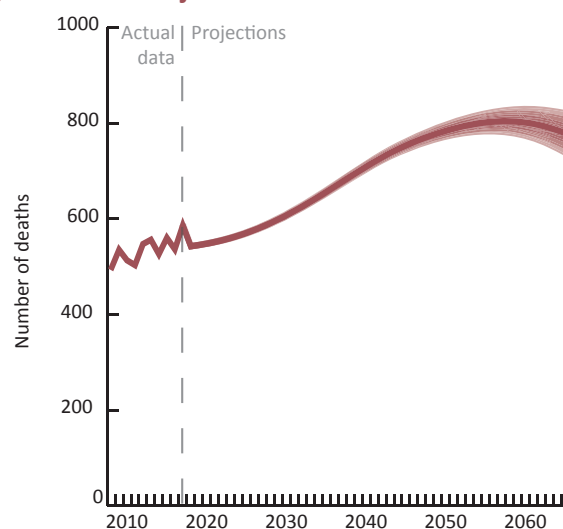**Figure 6.1.2: Projected number of deaths**

Table 6.1.1: Projection of births and deaths
(assuming annual net migration of 100 people and fertility rate of 1.6)

	Births	Deaths
Current (March 2017)	571	586
2020	597	548
2025	587	570
2030	566	607
2035	549	656
2040	536	709
2045	528	753
2050	520	784
2055	507	801
2060	495	801
2065	483	779

Appendix 1: Data assumptions

All economic and actuarial projections are based on assumptions about what is going to happen in the future. This is a necessary part of this type of analysis but, since future events are never certain, it introduces uncertainty into the projections.

Assumptions are typically chosen by examining historical data, so that the expectation of the future is derived with reference to what has happened in the past. However, all data series are subject to volatility to a greater or lesser extent and there is always the possibility of structural changes in data series. For example, total fertility rates in the UK between 1946 and 1970 were consistently well above the 2.1 replacement rate (a period known as the baby boom) but fell to 1.7 by 1977 and have remained consistently below 1.9 ever since. While projections are made with sensitivity analysis which can reflect uncertainty due to volatility, major structural changes are usually much more difficult to predict.

Fertility rates

The total fertility rate is the number of children the average woman is expected to give birth to in her lifetime. It governs the total number of children who are projected to be born in Guernsey and, as these children grow up, contributes to the number of people in increasingly older age groups. There is a natural delay in the time it takes for fertility rates to impact population projections at these older age groups. Projections of young people are affected immediately, and naturally projections of the adult population are not significantly affected for more than 16 years. Projections of people aged 85 or over are not affected at all over the projected period.

Fertility rates in Guernsey have averaged 1.6 over the past 5 years (**figure A1.1**) and this is applied as the central assumption. Sensitivity analysis includes the fertility rates ranging from 1.5 to 1.7.

By age, fertility rates are assumed to follow the pattern described by **figure A1.2**.

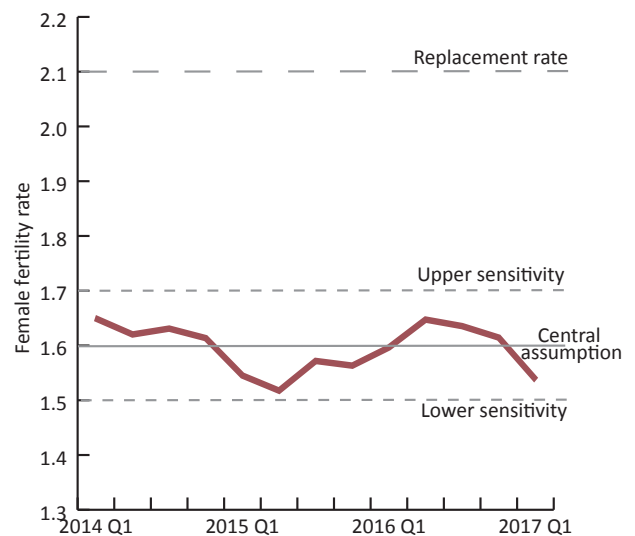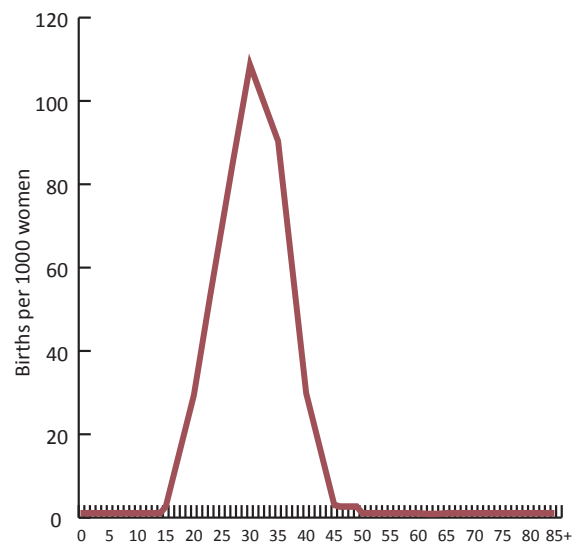**Figure A1.1: Actual total fertility rate**

Figure A1.2: Assumed fertility by age

Net migration

Net migration is the difference between the number of people who immigrate to Guernsey and the number who emigrate each year. Levels of net migration are very volatile and in the past decade have varied between net immigration of 443 people in the year ending March 2008 to net emigration of 464 people in the year ending March 2013 (**figure A1.3**). Levels of net migration are tied to the economic cycle and tend to be higher during periods of high economic growth.

Central assumptions are set at net annual immigration averaging 100 people per annum, which is broadly equivalent to the average level of net migration over the past decade. Upper and lower limits on sensitivity analysis are set respectively at net immigration of 400 people per annum and net emigration of 200 people reflecting the degree of uncertainty in this variable.

Consistent with observed net migration patterns it is assumed that migration generally occurs within the working age population (**figure A1.4**) and younger adults in particular.

Mortality

Population mortality is assumed to improve over time and average life expectancy is projected to increase. **Full details of mortality tables applied to the projections are available on request.**
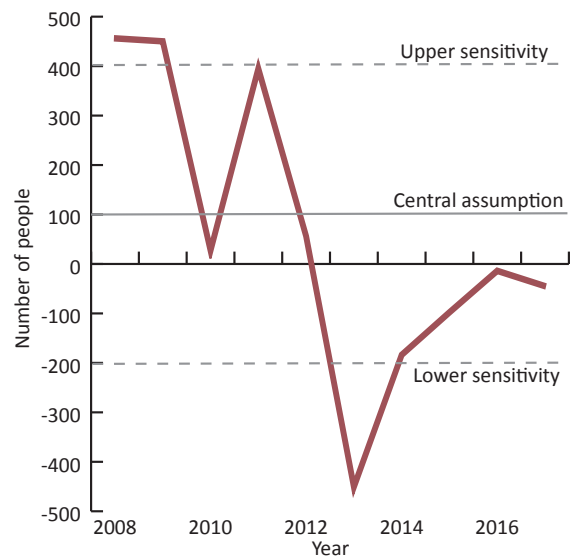
Figure A1.3: Actual net migration

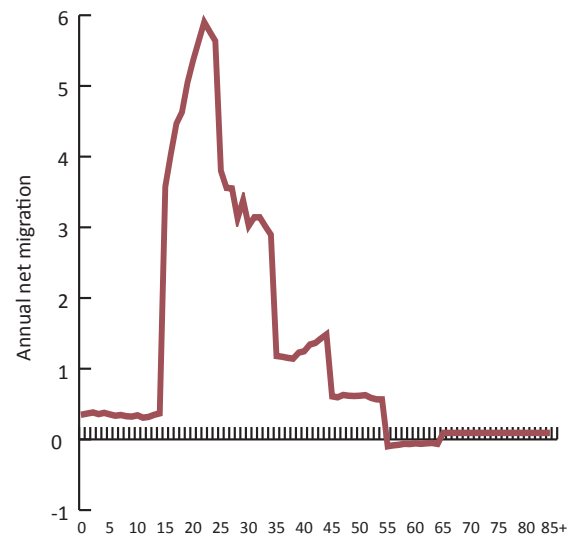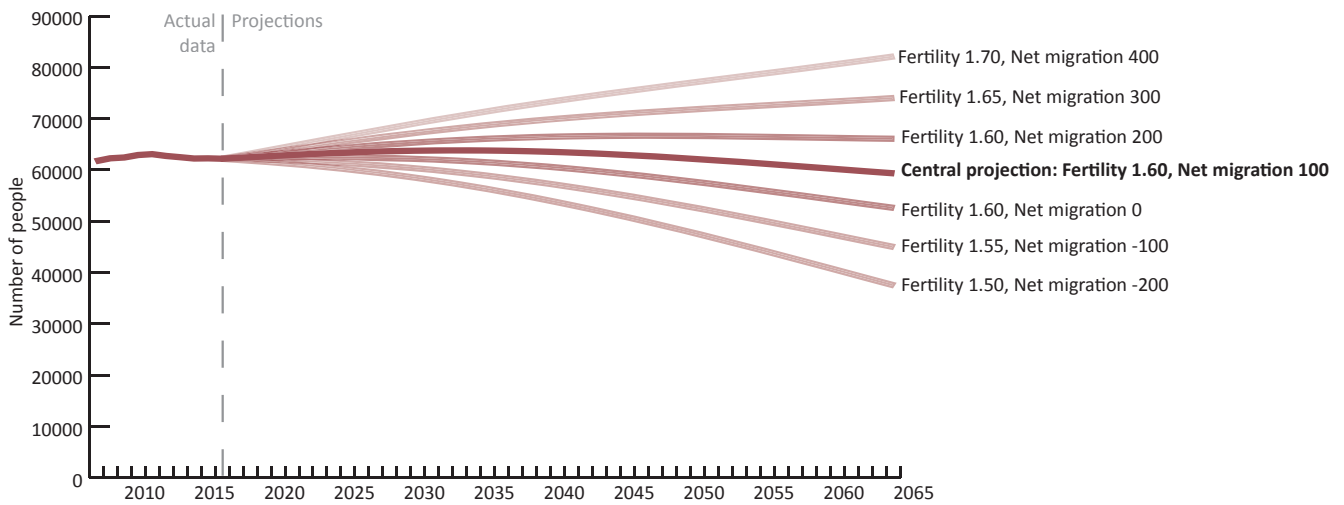**Figure A1.4: Assumed pattern of net migration by age (at 100 net immigration)**

Figure A1.5: Application of sensitivity analysis to population projections

Fertility 1.70, Net migration 400
Fertility 1.65, Net migration 300
Fertility 1.60, Net migration 200
Central projection: Fertility 1.60, Net migration 100
Fertility 1.60, Net migration 0
Fertility 1.55, Net migration -100
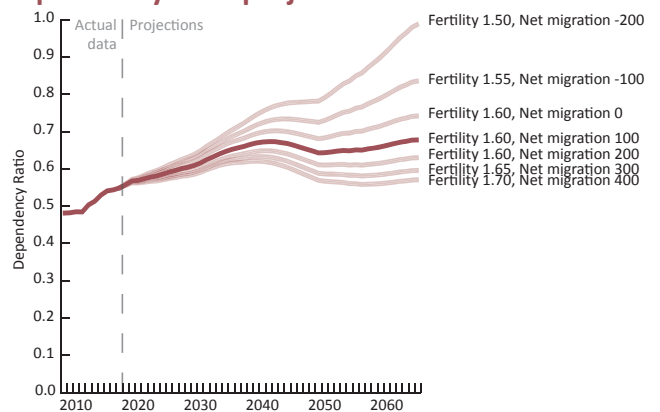Fertility 1.50, Net migration -200

Application of sensitivity to projections.

As described, alternative assumptions of fertility rates and migration have been applied to population projections in order to illustrate the sensitivity of these projections to these assumptions. It also serves to illustrate the degree of uncertainty inherent in projecting future trends.

Figures A1.5 and A1.4 show the assumptions applied to the fan charts for both population numbers and dependency ratios. Note that increasing assumptions of net migration and fertility rates increases the numbers of people in the population and decrease dependency ratios.

Figure A1.6: Application of sensitivity analysis to dependency ratio projections

Fertility 1.50, Net migration -200
Fertility 1.55, Net migration -100
Fertility 1.60, Net migration 0
Fertility 1.60, Net migration 100
Fertility 1.60, Net migration 200
Fertility 1.65, Net migration 300
Fertility 1.70, Net migration 400

1.3 Contact Details

Statistical publications issued by the States of Guernsey are available online at **www.gov.gg/data**.

For more information on this publication issued by the States of Guernsey, please contact:

Email: dataandanalysis@gov.gg

Telephone: (01481) 717000